

# ESA620

## Electrical Safety Analyzer

### Technical Data



The ESA620 Electrical Safety Analyzer, featuring smart technology to enhance productivity under any standard, represents the next generation in portable electrical safety testers. With selections of three test loads, two protective earth test currents and two insulation test voltages, this versatile device performs all primary electrical safety tests as well as several additional leakage tests for premium standards compliance worldwide.

A convenient 20 A device receptacle broadens the range of equipment that can be tested using the ESA620. Standard 2-wire and optional 4-wire protective earth measurement capabilities offer first-rate time savings, while new DSP technology offers better accuracy of leakage measurements throughout specified ranges.

Equipped with ten unique safety-enhanced ECG posts, the ESA620 offers simulation of ECG and performance waveforms so both electrical safety and basic tests on patient monitors can be performed with a single connection. When combined with optional Ansur computer-based software, the ESA620 allows for test procedure automation, the capture of results and comparison to standard limits, printed reports, and total digital data management.

### Key features

- Superior compliance with multiple standards: IEC60601:2005, EN62353, VDE 751, ANSI/AAMI ES1:1993, NFPA-99, AN/NZS 3551, IEC61010
- Three test loads
- Expanded leakage ranges through 10,000  $\mu$ A
- Dual-lead resistance, leakage, and voltage tests
- AC only, dc only and true-rms leakage readings
- 100 % and 110 % mains voltage for mains on applied part (lead isolation) test
- 200 mA and 25 A ac PE test current
- DSP filter technology for improved accuracy in leakage measurements
- 20 A equipment current
- More applied parts selections
- ECG and performance waveforms
- Intuitive user interface
- Easy-to-use applied parts (ECG) connections
- Insulation posts on applied parts connections
- Five different insulation tests
- Varying insulation test voltage 500 V dc and 250 V dc
- 2- or (optional) 4-wire ground wire resistance
- Optional Ansur plug-in software
- USB connection
- CE, C-TICK and CSA for USA and Canada
- RoHS compliance
- Designed, tested, and built to incomparable Fluke quality standards

## Specifications

Voltage		
<b>Range (mains voltage)</b>	90 V to 132 V ac rms	
	180 V to 264 V ac rms	
<b>Range (accessible voltage)</b>	0 V to 300 V ac rms	
<b>Accuracy</b>	± (2 % of reading + 2 LSD)	
<b>Voltage tests</b>	Mains, accessible, and point-to-point	
Earth resistance		
<b>Two-terminal mode test current/range and accuracy</b>	> 200 mA ac	0.0 to 2.0 Ω ± (2 % of reading + 0.015 Ω)
	10 A to 25 A ac	0.0 to 0.2 Ω ± (2 % of reading + 0.015 Ω) 0.2 to 2.0 Ω ± (5 % of reading + 0.015 Ω)
<b>Four-terminal mode test current/range and accuracy</b>	> 200 mA ac	0.0 to 2.0 Ω ± (2 % of reading + 0.005 Ω)
	10 A to 25 A ac	0.0 to 0.2 Ω ± (2 % of reading + 0.005 Ω) 0.2 to 2.0 Ω ± (5 % of reading + 0.005 Ω)
<b>Resistance tests</b>	Earth resistance and point-to-point	
Equipment current		
<b>Mode</b>	AC rms	
<b>Range/accuracy</b>	0 A to 20 A	± 5 % of reading ± (2 counts or .2 A, whichever is greater)
<b>Duty cycle</b>	15 A to 20 A, 5 min on/5 min off 10 A to 15 A, 7 min on/3 min off 0 A to 10 A continuous	
Leakage current		
<b>Modes*</b>	AC + DC (True-rms)	
	AC only	
	DC only	
<b>* Modes are available in all leakage tests with the exception of MAP leakages that are available only in true-rms</b>		
<b>Patient load selection (input impedance)</b>	AAMI ES1-1993 Fig.1	
	IEC 60601: Fig 15	
	IEC 61010: Fig. A-1	
<b>Crest factor</b>	≤ 3	
<b>Ranges</b>	0 µA to 199.9 µA	
	200 µA to 1999 µA	
	2 mA to 10 mA	
<b>Frequency response/accuracy</b>	DC to 1 kHz	± (1 % of reading + 1 µA)
	1 kHz to 100 kHz	± (2 % of reading + 1 µA)
	100 kHz to 1 MHz	± (5 % of reading + 1 µA)
<b>Leakage tests</b>	Earth (ground wire)	
	Chassis (enclosure)	
	Patient (lead to ground)	
	Patient auxiliary (lead to lead)	
	Mains on applied part (lead isolation)	
	Direct equipment	
	Direct applied part	
	Alternative equipment	
	Alternative applied part	
	Accessible	
	Point to point	

<b>Mains on applied part test voltage</b>	110 % of mains at 230 V for IEC 60601	
	100 % of mains for AAMI at 115 V per AAMI	
	100 % of mains at 230 V per 62353	
<b>Differential leakage</b>		
<b>Ranges</b>	10 $\mu$ A to 199 $\mu$ A	
	200 $\mu$ A to 1999 $\mu$ A	
	2 mA to 20 mA	
<b>Accuracy</b>	$\pm$ 10 % of reading $\pm$ (2 counts or 20 $\mu$ A, whichever is greater)	
<b>Insulation resistance</b>		
<b>Ranges/accuracy</b>	0.5 M $\Omega$ to 20 M $\Omega$	$\pm$ (2 % of reading + 2 counts)
	20 M $\Omega$ to 100 M $\Omega$	$\pm$ (7.5 % of reading + 2 counts)
<b>Source test voltage</b>	500 V dc	
	250 V dc	
<b>Insulation resistance tests</b>	Mains-PE, AP-PE, Mains- PE, Mains-NE (non-earthed accessible conductive part) and AP- NE (non-earthed accessible conductive part)	
<b>Mamimum load capacitance</b>	1 $\mu$ F	
<b>ECG performance waveforms</b>		
<b>Accuracy</b>	$\pm$ 2 %	
	$\pm$ 5 % for amplitude of 2 Hz square wave only, fixed at 1 mV Lead II configuration	
<b>Waveforms</b>	<b>Rates</b>	
	ECG complex (BPM)	30, 60, 120, 180, and 240
	<b>Ventricular fibrillation</b>	
	Square wave (50 % duty cycle) (Hz)	0.125 and 2
	Sine wave (Hz)	10, 40, 50, 60, and 100
	Triangle wave (Hz)	2
	Pulse (63 ms pulse width)	30 and 60
<b>Power ratings</b>		
<b>Mains voltage outlet</b>	120 V ac	230 V ac
<b>Mains voltage inlet power range</b>	90 to 132 V ac rms	180 to 264 V ac rms
<b>Maximum current</b>	20 A	16 A
<b>Hz</b>	50 or 60	50 or 60
<b>Physical case</b>		
<b>Dimensions (L x W x H)</b>	31 cm x 23 cm x 10 cm (12.2 in x 9 in x 2.9 in)	
<b>Weight</b>	4.7 kg (10.25 lb)	
<b>Environmental specifications</b>		
<b>Operating temperature</b>	10 °C to 40 °C	
<b>Storage temperature</b>	-20 °C to 60 °C	
<b>Operating humidity</b>	10 % to 90 % non-condensing	
<b>Altitude</b>	To 2,000 meters	
<b>General</b>		
<b>Warranty</b>	Two-year extended warranty*	

\*No-cost extended warranty available after first-year calibration at any Fluke Biomedical authorized service center.



## Ordering information

### Models

- 2785725** ESA620 Electrical Safety Analyzer US, 115 V 20 A
- 3051408** ESA620 Electrical Safety Analyzer EUR, 230 V
- 3051390** ESA620 Electrical Safety Analyzer FR, 230 V
- 3051413** ESA620 Electrical Safety Analyzer ISR, 230 V
- 3051424** ESA620 Electrical Safety Analyzer ITA, 230 V
- 3051436** ESA620 Electrical Safety Analyzer AUS, 230 V
- 3051449** ESA620 Electrical Safety Analyzer UK, 230 V
- 3051451** ESA620 Electrical Safety Analyzer SWI, 230 V

### Standard accessories

- 2814967** Operator's Manual CD
- 2814971** Multilingual Getting Started Guide
- 2195732** 15 A to 20 A Adapter (USA only)
- 2814980** Carrying Case
- 1626219** Data Transfer Cable
- Power Cord** (country specific)
- ESA620 Accessory Kit** (country specific)

### Optional accessories

- 3116463** Ansur ESA620 Plug-In
- 1903307** Retractable Test Leads
- 2242165** Ground Pin Adapter
- 2067864** Kelvin Cable Set for 4-Wire Measurement

### About Fluke Biomedical

Fluke Biomedical is the world's leading manufacturer of quality biomedical test and simulation products. In addition, Fluke Biomedical provides the latest medical imaging and oncology quality-assurance solutions for regulatory compliance. Highly credentialed and equipped with a NVLAP Lab Code 200566-6 accredited laboratory, Fluke Biomedical also offers the best in quality and customer service for all your equipment calibration needs.

Today, biomedical personnel must meet the increasing regulatory pressures, higher quality standards, and rapid technological growth, while performing their work faster and more efficiently than ever. Fluke Biomedical provides a diverse range of software and hardware tools to meet today's challenges.

### Fluke Biomedical Regulatory Commitment

As a medical test device manufacturer, we recognize and follow certain quality standards and certifications when developing our products. We are ISO 9001 certified and our products are:

- CE Certified, where required
- NIST Traceable and Calibrated
- UL, CSA, ETL Certified, where required
- NRC Compliant, where required